What is claimed is:

1. A sensor platform for a simultaneous determination of at least one luminescence from a plurality of measurement areas, said sensor platform comprising:

a plurality of laterally separated measurement areas, wherein a density of said plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter;

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than said first optically transparent layer, said first optically transparent layer being on said second optically transparent layer, and a grating structure being operable to incouple excitation light to said plurality of laterally separated measurement areas, wherein said plurality of laterally separated measurement areas are located on said first optically transparent layer, said grating structure is continuously modulated in an area of said plurality of laterally separated measurement areas, and said grating structure is operable to prevent a cross-talk of luminescence generated in any one measurement area of said plurality of laterally separated measurement areas and coupled back into said first optically transparent layer to any other measurement area of said plurality of laterally separated measurement areas; and

a plurality of recognition elements immobilized in said plurality of laterally separated measurement areas, said plurality of recognition elements being operable to assist in a qualitative or quantitative determination of at least one analyte in a sample in contact with said plurality of laterally separated measurement areas.

2. A sensor platform according to claim 1, wherein said plurality of laterally separated measurement areas are split into at least two laterally separated segments, each of

said laterally separated segments comprising at least two of said plurality of laterally separated measurement areas.

3. A sensor platform according to claim 1, wherein said grating structure is a superposition of a plurality of grating structures of different periodicities for the incoupling of excitation light of different wavelengths.

4. A sensor platform according to claim 1, further comprising a third optically transparent layer in contact with said first optically transparent layer, wherein said third optically transparent layer has a lower refractive index than said first optically transparent layer and said third optically transparent layer has a thickness of 5 nm – 10,000 nm and is located between said first optically transparent layer and said second optically transparent layer.

5. A sensor platform according to claim 1, further comprising an adhesion-promoting layer with a thickness of less than 200 nm deposited on said first optically transparent layer, said adhesion-promoting layer operable to immobilize one of biological elements, biochemical elements and synthetic recognition elements, wherein said adhesion-promoting layer comprises chemical compounds from a group consisting of silanes, epoxides, and self-organized functionalized monolayers.

6. A sensor platform according to claim 1, wherein said plurality of laterally separated measurement areas are generated by laterally selective deposition of at least one of biological elements, biochemical elements and synthetic recognition elements on said sensor platform, by one of jet spotting, mechanical spotting, micro contact printing, and fluidic contacting said plurality of laterally separated measurement areas with said at least one of biological elements, biochemical elements and synthetic recognition elements

supplied in parallel or by crossed micro channels, upon application of one of pressure differences, electric potentials and electromagnetic potentials.

7. A sensor platform according to claim 6, wherein said at least one of biological elements, biochemical elements and synthetic recognition elements, components of a group consisting of nucleic acids and nucleic acid analogues, antibodies, aptamers, membrane-bound and isolated receptors, ligands of the membrane-bound and isolated receptors, antigens for antibodies, histidine-tag components, and molecular imprints hosted in cavities generated by chemical synthesis, are deposited as whole cells or cell fragments.

8. A sensor platform according to claim 6, further comprising compounds, which are chemically neutral towards the at least one analyte, deposited between said plurality of laterally separated measurement areas in order to minimize nonspecific binding or adsorption.

9. A sensor platform according to claim 1, wherein said plurality of laterally separated measurement areas is up to 100,000 laterally separated measurement areas provided in a two-dimensional arrangement and a single laterally separated measurement area has an area of 0.001 mm^2 – 6 mm^2.

10. A sensor platform according to claim 1, wherein said grating structure is one of a diffractive grating with a uniform period and a multidiffractive grating.

11. A sensor platform according to claim 1, wherein said grating structure has a laterally varying periodicity either in parallel or perpendicular to a direction of propagation of the incoupled excitation light in said first optically transparent layer.

12. A sensor platform according to claim 1, wherein said second optically transparent layer comprises one of quartz, glass or transparent thermoplastic.

13. A sensor platform according to claim 1, wherein said first optically transparent layer has a refractive index that is higher than 2.

14. A sensor platform according to claim 1, wherein said first optically transparent layer comprises one of TiO_2, ZnO, Nb_2O_5, Ta_2O_5, HfO_2, or ZrO_2.

15. A sensor platform according to claim 1, wherein said first optically transparent layer has a thickness of between 40 and 300 nm.

16. A sensor platform according to claim 1, wherein said grating structure has a period of 200 nm - 1,000 nm and a modulation depth of 3 nm – 100 nm.

17. A sensor platform according to claim 1, wherein, by incomplete incoupling and outcoupling of at least one of the excitation light and backcoupled luminescence light, a positive gradient of at least one of intensity of guided excitation light and generated luminescence light within at least one measurement area of said plurality of laterally separated measurement areas and across several measurement areas of said plurality of laterally separated measurement areas, that can be controlled by a depth of said grating structure, is generated in parallel to a direction of propagation of the incoupled excitation light.

18. A sensor platform according to claim 17, wherein said grating structure has a laterally varying grating depth in parallel with the direction of propagation of the incoupled excitation light.

19. A sensor platform according to claim 1, wherein at least one of a negative gradient of intensity of guided excitation light and generated luminescence light within at least one measurement area of said plurality of laterally separated measurement areas and across several measurement areas of said plurality of laterally separated measurement areas, that can be controlled by an extent of propagation losses in said first optically transparent layer, is generated in parallel to a direction of propagation of the incoupled excitation light.

20. A sensor platform according to claim 16, wherein a ratio of the modulation depth to a thickness of said first optically transparent layer is equal or smaller than 0.2.

21. A sensor platform according to claim 1, wherein said grating structure is one of a relief grating with a rectangular, triangular or semi-circular profile and a phase or volume grating with a periodic modulation of a refractive index in said first optically transparent layer which is essentially planar.

22. A sensor platform according to claim 1, further comprising one of optically recognizable marks and mechanically recognizable marks operable to simplify adjustments in an optical system, or for connection to sample compartments as part of an analytical system.

23. An optical system for the determination of one or more luminescences, said optical system comprising:

at least one excitation light source operable to emit excitation light;

a sensor platform comprising:

a plurality of laterally separated measurement areas, wherein a density of said plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter;

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than said first optically transparent layer, said first optically transparent layer being on said second optically transparent layer, and a grating structure being operable to incouple the excitation light to said plurality of laterally separated measurement areas, wherein said plurality of laterally separated measurement areas are located on said first optically transparent layer, said grating structure is continuously modulated in an area of said plurality of laterally separated measurement areas, and said grating structure is operable to prevent a cross-talk of luminescence generated in any one measurement area of said plurality of laterally separated measurement areas and coupled back into said first optically transparent layer to any other measurement area of said plurality of laterally separated measurement areas; and

a plurality of recognition elements immobilized in said plurality of laterally separated measurement areas, said plurality of recognition elements being operable to assist in a qualitative or quantitative determination of at least one analyte in a sample in contact with said plurality of laterally separated measurement areas; and

at least one detector operable to collect light emanating from one or more of said plurality of laterally separated measurement areas on said sensor platform.

24. An optical system according to claim 23, wherein said at least one excitation light source launches the excitation light to said plurality of laterally separated measurement areas in an arrangement of direct or transmission illumination.

25. An optical system according to claim 23, wherein said at least one detector also collects luminescence light outcoupled by said grating structure.

26. An optical system according to claim 23, wherein the excitation light emitted from said at least one excitation light source is coherent and is launched to said plurality of

laterally separated measurement areas at a resonance angle for coupling into said first optically transparent layer.

27. An optical system according to claim 23, wherein said at least one excitation light source is a plurality of coherent light sources of one of similar and different emission wavelengths.

28. An optical system according to claim 27, wherein said grating structure is a superposition of a plurality of grating structures of different periodicities for the incoupling of excitation light of different wavelengths, and wherein said plurality of coherent light sources launch the excitation light either simultaneously or sequentially from different directions on said grating structure.

29. An optical system according to claim 23, wherein said at least one detector is a laterally resolving detector from a group consisting of CCD cameras, CCD chips, photodiode arrays, avalanche diode arrays, multichannel plates and multichannel photomultipliers.

30. An optical system according to claim 23, further comprising at least one optical component being located between at least one of said at least one excitation light source and said sensor platform and said sensor platform and said at least one detector, said at least one optical component comprising at least one of:

a lense or a lens system operable to shape at least one of the excitation light and the one or more luminescences;

a planar mirror or a curved mirror for deviation of at least one of the excitation light and the one or more luminescences;

a prism for deviation of at least one of the excitation light and the one or more luminescences;

a dichroic mirror for the spectrally selective deviation of parts of at least one of the excitation light and the one or more luminescences;

a neutral density filter for regulation of light intensity of at least one of the excitation light and the one or more luminescences;

an optical filter or a monochromator for spectrally selective transmission of parts of at least one of the excitation light and the one or more luminescences; and

a polarization selective element for selection of discrete polarization directions of at least one of the excitation light and the one or more luminescences.

31. An optical system according to claim 23, wherein said at least one excitation light source launches the excitation light in pulses with a duration of 1 fsec to 10 min and emission light from said plurality of laterally separated measurement areas is measured time-resolved.

32. An optical system according to claim 23, wherein said at least one detector measures light signals from at least one of the excitation light at a location of said at least one excitation light source, the excitation light after expansion, the excitation light after being multiplexed into individual beams, scattered excitation light from a location of one or more measurement areas of said plurality of laterally separated measurement areas, and the excitation light outcoupled by said grating structure beside said plurality of measurement areas for referencing purposes as a reference signal.

33. An optical system according to claim 32, wherein said one or more of said plurality of measurement areas for determination of the emission light and for the determination of the reference signal are the same.

34. An optical system according to claim 23, wherein said at least one excitation light source and said at least one detector respectively launch the excitation light and detect the emission light from said plurality of laterally separated measurement areas sequentially for one or more measurement areas of said plurality of laterally separated measurement areas.

35. An optical system according to claim 34, wherein said sensor platform is operable to be moved between the sequential excitation and detection.

36. An analytical system for the determination of one or more analytes in at least one sample by luminescence detection, said analytical system comprising:

at least one excitation light source operable to emit excitation light;

a sensor platform comprising:

a plurality of laterally separated measurement areas, wherein a density of said plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter;

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than said first optically transparent layer, said first optically transparent layer being on said second optically transparent layer, and a grating structure being operable to incouple the excitation light to said plurality of laterally separated measurement areas, wherein said plurality of laterally separated measurement areas are located on said first optically transparent layer, said grating structure is continuously modulated in an area of said plurality of laterally separated measurement areas, and said grating structure is operable to prevent a cross-talk of luminescence generated in said plurality of laterally separated measurement areas, and coupled back into said first optically transparent layer to any other measurement area of said plurality of laterally separated measurement areas; and

at least one recognition element immobilized in said plurality of laterally separated measurement areas, said at least one recognition element being operable to assist in a qualitative or quantitative determination of the one or more analytes in the at least one sample in contact with said plurality of laterally separated measurement areas;

at least one detector operable to collect light emanating from said plurality of laterally separated measurement areas on said sensor platform; and

supply means for supplying the at least one sample in contact with said plurality of laterally separated measurement areas on said sensor platform.

37. An analytical system according to claim 36, further comprising at least one sample compartment which is at least in the area of at least one laterally separated measurement area of said plurality of laterally separated measurement areas, wherein said at least one sample compartment has a volume of 0.1 nl – 100 µl.

38. An analytical system according to claim 37, wherein said at least one sample compartment has at least one opening for supplying and removing samples at a side opposite to said first optically transparent layer, said at least one sample compartment being otherwise closed, and wherein the supplying and removing of the samples is performed in a closed flow through system.

39. An analytical system according to claim 37, wherein said at least one sample compartment has an opening for supplying or removing samples or other reagents at a side opposite to said first optically transparent layer.

40. An analytical system according to claim 37, wherein said at least one sample compartment is adapted to accept reagents such that the reagents can be wetted during an

assay for the determination of the one or more analytes and in contact with said at least one laterally separated measurement area.

41. A method comprising simultaneously determining by luminescence detection, at least one analyte in one or more samples with a sensor platform comprising

a plurality of laterally separated measurement areas, wherein a density of the plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter,

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than the first optically transparent layer, the first optically transparent layer being on the second optically transparent layer, and a grating structure being operable to incouple excitation light to the plurality of laterally separated measurement areas, wherein the plurality of laterally separated measurement areas are located on the first optically transparent layer, the grating structure is continuously modulated in an area of the plurality of laterally separated measurement areas, and the grating structure is operable to prevent a cross-talk of luminescence generated in any one measurement area of the plurality of laterally separated measurement areas and coupled back into the first optically transparent layer to any other measurement area of the plurality of laterally separated measurement areas, and

a plurality of recognition elements immobilized in the plurality of laterally separated measurement areas, the plurality of recognition elements being operable to assist in a qualitative or quantitative determination of the at least one analyte in the one or more samples in contact with the plurality of laterally separated measurement areas to determine the at least one analyte in the one or more samples.

42. A method according to claim 41, wherein said grating structure couples in the excitation light for the plurality of laterally separated measurement areas.

43. A method according to claim 41, further comprising simultaneously measuring at least one of isotropically emitted luminescence or luminescence that is coupled back into the first optically transparent layer and outcoupled by the grating structure.

44. A method comprising determining one or more analytes by luminescence detection with a sensor platform comprising

a plurality of laterally separated measurement areas, wherein a density of the plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter,

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than the first optically transparent layer, the first optically transparent layer being on the second optically transparent layer, and a grating structure being operable to incouple excitation light to the plurality of laterally separated measurement areas, wherein the plurality of laterally separated measurement areas are located on the first optically transparent layer, the grating structure is continuously modulated in an area of the plurality of laterally separated measurement areas, and the grating structure is operable to prevent a cross-talk of luminescence generated in any one measurement area of the plurality of laterally separated measurement areas and coupled back into the first optically transparent layer to any other measurement area of the plurality of laterally separated measurement areas, and

a plurality of recognition elements immobilized in the plurality of laterally separated measurement areas, the plurality of recognition elements being operable to assist in a qualitative or quantitative determination of at least one analyte in a sample in contact with the plurality of laterally separated measurement areas,

wherein, by incomplete incoupling and outcoupling of at least one of the excitation light and backcoupled luminescence light, a positive gradient of at least one of an intensity of guided excitation light and an intensity of the generated luminescence within at least one

measurement area of the plurality of laterally separated measurement areas and across several measurement areas of the plurality of laterally separated measurement areas, that can be controlled by a depth of the grating structure, is generated in parallel to a direction of propagation of the incoupled excitation light, and

wherein at least one of a dynamic range for signal measurement and a quantitative analyte determination can be increased or limited by a controllable gradient of at least one of the guided excitation light and excited luminescence light in parallel to the direction of propagation of the incoupled excitation light, within at least one of a single measurement area of the plurality of laterally separated measurement areas and across several measurement areas of the plurality of laterally separated measurement areas.

45. A method according to claim 41, wherein one of a luminescent dye and a nanoparticle is used as a luminescence label for generation of the luminescence, which can be excited and emits at a wavelength between 300 nm and 1100 nm.

46. A method according to claim 45, wherein the luminescence label is bound to one of the one or more analytes, an analyte analogue in a competitive assay, and one of binding partners of the plurality of recognition elements or the plurality of recognition elements in a multi-step assay.

47. A method according to claim 45, wherein at least one additional luminescence label is used.

48. A method according to claim 47, wherein the second or more luminescence labels can be excited at the same wavelength as the first luminescence label, but emit at other wavelengths.

49. A method according to claim 47, wherein the luminescence label and the at least one additional luminescence label are luminescent dyes that have excitation and emission spectra that do not or only partially overlap.

50. A method according to claim 47, wherein the luminescence label and the at least one additional luminescence label are luminescent dyes and charge transfer or optical energy transfer from a first luminescent dye acting as a donor to a second luminescent dye acting as an acceptor is used for the detection of the one or more analytes.

51. A method according to claim 41, further comprising determining changes of an effective refractive index on the plurality of laterally separated measurement areas in addition to determining one or more analytes by luminescence.

52. A method according to claim 41, wherein at least one of said determining the one or more analytes by luminescence and determination of light signals at excitation wavelengths are performed as polarization-selective, and wherein one or more luminescences are measured at a polarization that is different from a polarization of the excitation light.

53. A method comprising simultaneously or sequentially determining one or more analytes from a group consisting of antibodies or antigens, receptors or ligands, chelators or histidine-tag components, oligonucleotides, DNA or RNA strands, DNA or RNA analogues, enzymes, enzyme cofactors or inhibitors, lectins and carbohydrates in one or more samples with a sensor platform comprising

a plurality of laterally separated measurement areas, wherein a density of the plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter,

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than the first optically transparent layer, the first optically transparent layer being on the second optically transparent layer, and a grating structure being operable to incouple excitation light to the plurality of laterally separated measurement areas, wherein the plurality of laterally separated measurement areas are located on the first optically transparent layer, the grating structure is continuously modulated in an area of the plurality of laterally separated measurement areas, and the grating structure is operable to prevent a cross-talk of luminescence generated in any one measurement area of the plurality of laterally separated measurement areas and coupled back into the first optically transparent layer to any other measurement area of the plurality of laterally separated measurement areas, and

a plurality of recognition elements immobilized in the plurality of laterally separated measurement areas, the plurality of recognition elements being operable to assist in a qualitative or quantitative determination of the one or more analytes in the one or more samples in contact with the plurality of laterally separated measurement areas to determine the one or more analytes in the one or more samples.

54. A method according to claim 41, wherein the one or more samples to be examined are naturally occurring body fluids from a group consisting of blood, serum, plasma, lymph, urine, and egg yolk, optically turbid liquids, surface water, soil extracts, plant extracts, bio- or process broths, or a substance taken from biological tissue.

55. A method comprising determining one of chemical, biochemical and biological analytes with a sensor platform comprising

a plurality of laterally separated measurement areas, wherein a density of the plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter,

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than the first optically transparent layer, the first optically transparent layer being on the second optically transparent layer, and a grating structure being operable to incouple excitation light to the plurality of laterally separated measurement areas, wherein the plurality of laterally separated measurement areas are located on the first optically transparent layer, the grating structure is continuously modulated in an area of the plurality of laterally separated measurement areas, and the grating structure is operable to prevent a cross-talk of luminescence generated in any one measurement area of the plurality of laterally separated measurement areas and coupled back into the first optically transparent layer to any other measurement area of the plurality of laterally separated measurement areas, and

a plurality of recognition elements immobilized in the plurality of laterally separated measurement areas, the plurality of recognition elements being operable to assist in a qualitative or quantitative determination of at least one analyte in one or more samples in contact with the plurality of laterally separated measurement areas to determine the at least one analyte in the one or more samples.

56. A sensor platform for a simultaneous determination of at least one luminescence from a plurality of measurement areas, said sensor platform comprising:

a plurality of laterally separated measurement areas, wherein a density of said plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter;

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than said first optically transparent layer, said first optically transparent layer being on said second optically transparent layer, and a grating structure continuously modulated in an area of said plurality of laterally separated measurement areas, wherein said plurality of laterally separated measurement areas

are located on said first optically transparent layer, and said grating structure is operable to prevent a cross-talk of luminescence generated in any one measurement area of said plurality of laterally separated measurement areas and coupled back into said first optically transparent layer to any other measurement area of said plurality of laterally separated measurement areas; and

a plurality of recognition elements immobilized in said plurality of laterally separated measurement areas, said plurality of recognition elements being operable to assist in a qualitative or quantitative determination of at least one analyte in a sample in contact with said plurality of laterally separated measurement areas.

57. A sensor platform according to claim 56, wherein said plurality of laterally separated measurement areas are split into at least two laterally separated segments, each of said laterally separated segments comprising at least two of said plurality of laterally separated measurement areas.

58. An optical system for the determination of one or more luminescences, said optical system comprising:

at least one excitation light source operable to emit excitation light;

a sensor platform comprising:

a plurality of laterally separated measurement areas, wherein a density of said plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter;

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than said first optically transparent layer, said first optically transparent layer being on said second optically transparent layer, and a grating structure continuously modulated in an area of said plurality of laterally separated measurement areas, wherein said plurality of laterally separated

measurement areas are located on said first optically transparent layer, and said grating structure is operable to prevent a cross-talk of luminescence generated in any one measurement area of said plurality of laterally separated measurement areas and coupled back into said first optically transparent layer to any other measurement area; and

a plurality of recognition elements immobilized in said plurality of laterally separated measurement areas, said plurality of recognition elements being operable to assist in a qualitative or quantitative determination of at least one analyte in a sample in contact with said plurality of laterally separated measurement areas; and

at least one detector operable to collect light emanating from one or more of said plurality of laterally separated measurement areas on said sensor platform.

59. An analytical system for the determination of one or more analytes in at least one sample by luminescence detection, said analytical system comprising:

at least one excitation light source operable to emit excitation light;

a sensor platform comprising:

a plurality of laterally separated measurement area, wherein a density of said plurality of laterally separated measurement area is at least 16 measurement areas per square centimeter;

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than said first optically transparent layer, said first optically transparent layer being on said second optically transparent layer, and a grating structure continuously modulated in an area of said plurality of laterally separated measurement areas, wherein said plurality of laterally separated measurement areas are located on said first optically transparent layer, and said grating structure is operable to prevent a cross-talk of luminescence generated in said plurality of laterally separated measurement areas and coupled back into said first optically transparent

layer to any other measurement area of said plurality of laterally separated measurement areas; and

at least one recognition element immobilized in said plurality of laterally separated measurement areas, said at least one recognition element being operable to assist in a qualitative or quantitative determination of the one or more analytes in the at least one sample in contact with said plurality of laterally separated measurement areas;

at least one detector operable to collect light emanating from said plurality of laterally separated measurement areas on said sensor platform; and

supply means for supplying the at least one sample in contact with said plurality of laterally separated measurement areas on said sensor platform.

60. A method comprising simultaneously determining by luminescence detection, at least one analyte in one or more samples with a sensor platform comprising

a plurality of laterally separated measurement areas, wherein a density of the plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter,

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than the first optically transparent layer, the first optically transparent layer being on the second optically transparent layer, and a grating structure continuously modulated in an area of the plurality of laterally separated measurement areas, wherein the plurality of laterally separated measurement areas are located on the first optically transparent layer, and the grating structure is operable to prevent a cross-talk of luminescence generated in any one measurement area of the plurality of laterally separated measurement areas and coupled back into the first optically transparent layer to any other measurement area of the plurality of laterally separated measurement areas, and

a plurality of recognition elements immobilized in the plurality of laterally separated measurement areas, the plurality of recognition elements being operable to assist in a qualitative or quantitative determination of the at least one analyte in the one or more samples in contact with the plurality of laterally separated measurement areas to determine the at least one analyte in the one or more samples.

61. A method comprising simultaneously or sequentially determining one or more analytes from a group consisting of antibodies or antigens, receptors or ligands, chelators or histidine-tag components, oligonucleotides, DNA or RNA strands, DNA or RNA analogues, enzymes, enzyme cofactors or inhibitors, lectins and carbohydrates in one or more samples with a sensor platform comprising

a plurality of laterally separated measurement areas, wherein a density of the plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter,

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than the first optically transparent layer, the first optically transparent layer being on the second optically transparent layer, and a grating structure continuously modulated in an area of the plurality of laterally separated measurement areas, wherein the plurality of laterally separated measurement areas are located on the first optically transparent layer, and the grating structure is operable to prevent a cross-talk of luminescence generated in any one measurement area of the plurality of laterally separated measurement areas, and coupled back into the first optically transparent layer to any other measurement area of the plurality of laterally separated measurement areas, and

a plurality of recognition elements immobilized in the plurality of laterally separated measurement areas, the plurality of recognition elements being operable to assist in a qualitative or quantitative determination of the one or more analytes in the one or more

samples in contact with the plurality of laterally separated measurement areas to determine the one or more analytes in the one or more samples.

62. A method comprising determining one of chemical, biochemical and biological analytes with a sensor platform comprising

a plurality of laterally separated measurement areas, wherein a density of the plurality of laterally separated measurement areas is at least 16 measurement areas per square centimeter,

an optical film waveguide comprising a first optically transparent layer, a second optically transparent layer having a lower refractive index than the first optically transparent layer, the first optically transparent layer being on the second optically transparent layer, and a grating structure continuously modulated in an area of the plurality of laterally separated measurement areas, wherein the plurality of laterally separated measurement areas are located on the first optically transparent layer, and the grating structure is operable to prevent a cross-talk of luminescence generated in any one measurement area of the plurality of laterally separated measurement areas and coupled back into the first optically transparent layer to any other measurement area of the plurality of laterally separated measurement areas, and

a plurality of recognition elements immobilized in the plurality of laterally separated measurement areas, the plurality of recognition elements being operable to assist in a qualitative or quantitative determination of at least one analyte in one or more samples in contact with the plurality of laterally separated measurement areas to determine the at least one analyte in the one or more samples.